

Atty's 22725

Pat. App. 10/766,513

CLAIM AMENDMENTS

1 1. (currently amended) A method of making a part with
2 regions of different thickness from a plate workpiece having a pair
3 of substantially parallel plate faces, the method comprising the
4 steps of:

5 fitting the workpiece between a longitudinally extending
6 surface of a die and a substantially parallel surface of a punch
7 and between longitudinally confronting and transversely extending
8 shoulders of the die and punch with the workpiece faces lying
9 flatly against the punch and die surfaces and end edges of the
10 workpiece against the punch and die shoulders, the die being formed
11 at its surface with an opening;

12 relatively shifting the die and the punch to move the
13 respective shoulders longitudinally together parallel to the
14 surfaces and faces and thereby longitudinally compressing the
15 workpiece to extrude the workpiece transversely into the opening in
16 the die surface while bracing the workpiece transversely against
17 the punch surface.

2. (canceled)

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1 3. (currently amended) The method defined in claim 1
2 wherein the plate faces are in full surface contact with the die
3 and punch surfaces except at the opening, ~~the die and punch having~~
4 ~~confronting shoulders bearing on edges of the workpiece.~~

1 4. (original) The method defined in claim 1 wherein the
2 die surface is smoother than the punch surface, whereby the
3 workpiece sticks to the punch and slides on the die.

5. (canceled)

1 6. (original) The method defined in claim 1, further
2 comprising the step of
3 heating the plate workpiece before fitting it to the die
4 and punch.

1 7. (original) The method defined in claim 6 wherein the
2 workpiece is heated while fitted to the die and punch after
3 compression.

1 8. (original) The apparatus defined in claim 1 wherein
2 the plate workpiece is of metal.

1 9. (original) The apparatus defined in claim 8 wherein
2 the metal is aluminum or steel.

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1 10. (currently amended) An apparatus for [[of]] making
2 a part with regions of different thickness from a plate workpiece
3 having a pair of substantially parallel plate faces, the apparatus
4 comprising:

5 a die having a generally planar die surface and formed at
6 the surface with an opening;

7 a punch having a generally planar punch surface parallel
8 to and spaced from the die surface, the workpiece being fittable
9 between the surfaces with its faces in full surface contact with
10 the surfaces, the punch and die having shoulders projecting
11 generally perpendicular to the respective surfaces and engageable
12 with opposite end edges of the plate workpiece;

13 means for relatively shifting the punch and die relative
14 to each other parallel to the punch and die surfaces and thereby
15 compressing the workpiece to extrude the workpiece into the opening
16 in the die surface while bracing the workpiece in surface contact
17 against the die surface;

18 an abutment shiftable in the die transversely to the
19 surfaces in the opening and having an end face movable between an
20 advanced position generally flush with the die surface and a
21 retracted position offset back from the die surface; and
22 means for urging the abutment into the flush position.

11. (canceled)

12. (canceled)

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1 13. (original) The apparatus defined in claim 10
2 wherein the die and punch surfaces are spaced apart by a distance
3 equal substantially to a thickness of the plate workpiece.

1 14. (original) The apparatus defined in claim 10,
2 further comprising:.

1 15. (original) The apparatus defined in claim 14
2 wherein the urging means is a spring.

1 16. (new) A method of making a part with regions of
2 different thickness from a plate workpiece having a pair of
3 substantially parallel plate faces, the method comprising the steps
4 of:

5 fitting the workpiece between a smooth surface of a die
6 and a substantially parallel rough surface of a punch, the die
7 being formed at its surface with an opening; and

8 relatively shifting the die and the punch parallel to the
9 surfaces and faces and thereby compressing the workpiece to extrude
10 the workpiece into the opening in the die surface while bracing the
11 workpiece against the punch surface, whereby the workpiece sticks
12 to the rough surface of the punch and slides on the smooth surface
13 of the die.